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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

PROGRAM U. S. RADIO FARM SCHOOL RELEASE Monday, Oct. 3/27.

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U. S. Department of

(NOT FOR PUBLICATION)

Crops and Soils Meeting No. 1

Subject: The Farm Storage of Apples.

ANNOUNCEMENT: We will now have the first meeting of the season of the United States Radio Farm School. This "school" is just a meeting of the farmers of the neighborhood at the school-house to talk over their problems with a specialist of the Department of Agriculture. Mondays they will take up subjects relating to crops and soils. Wednesday of each week will be devoted to farm economics and community life, and Fridays will be given to livestock and dairy questions. As thousands of bushels of good apples are lost every year on the farms of the United States for want of proper storage, Will Logan, one of our farmers, is asking the Professor about the storage of apples.

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LOGAN: As I was saying, Professor, I'm getting ready to take care of my apples. According to reports, the apple crop is not as big as usual. I thought if I could only store mine until after the holidays, I might get a fair price for them. Of course, I understand that apples in storage must be kept cool, -- but how cool?

THE PROFESSOR: Well, the ideal is a cold storage house where the temperature can be kept right around 32 degrees, or as cold as possible without actually freezing the apples. But I take it that you are building what is known as a "common" or farm storage, and that you will have to depend upon the temperature of the outside air for cooling your house.

LOGAN: That's exactly what I'm doing, Professor. I read an article on the farm storage of apples and that is where I got my idea, but I thought maybe you would have some special information. I know there are some varieties not worth storing. Just what varieties of apples keep best, Professor?

THE PROFESSOR: "That depends. Out in the western country, Winesap, York Imperial, Yellow Newtown, Ben Davis, and Arkansas Black are good farm storage varieties. In the northeast Baldwin, Stark, Northern Spy, Rhode Island Greening and Black Twig are among the desirable varieties for placing in common storage. It depends a great deal on the season, however, and if the apples ripen early they are difficult to keep, but if they ripen late and can be stored when the weather is cool they keep in much better condition."

LOGAN: "That is another point that I want to ask about. How ripe should apples be allowed to become on the trees before they are picked?"

THE PROFESSOR: "The Department of Agriculture conducted some very careful experiments and found that the later the apples can remain on the trees without too great a loss from drop or danger of freezing, the better they will keep; also that if the apples are removed from the trees and left in the orchard, protected from sun and rain that they ripen more rapidly than if they remained on the trees. That is a point that every grower will have to determine, as no fixed rule can be laid down. It depends somewhat on variety, somewhat on the season itself, and to some extent on local conditions. The first essential is that the apples be well grown, sprayed during the growing season to protect them from insects and diseases, well colored, and that the trees are in a healthy condition."

LOGAN: "If I understand you right, Professor, the experiments showed that the apples will keep better in farm storage, if they get fully developed, but not overripe, and hang on the trees as long as it is safe to leave them."

THE PROFESSOR: "That has been the results of the experiments, Logan. Only in the case of some varieties like McIntosh and Grimes Golden which ripen rather quickly when they start to ripen, you might lose the whole crop if you put off picking for a few days too long, especially if you have a wind storm."

LOGAN: "When I pick the apples should I bring them directly into the storage house or should they stand in the orchard for a day or two."

THE PROFESSOR: "Personally, I do not know Logan, but the results of the experiments conducted by the Department show that if the outside temperature was lower than that of the storage house, it is better to leave them in the orchard or somewhere in the open where they will be fully protected from the sun and from rain, and where they will get plenty of air for a few days to cool before placing them in the storage house. Even standing them in crates or baskets in an open shed over night will often cool the apples and make them keep better in the storage house. The aim should be to get the fruit cooled just as soon as possible and keep it cool."

LOGAN: "According to the Department of Agriculture there are three types of common or farm storage houses for apples; the basement type, a semi-basement or hillside storage, and, an above ground storage. I am remodeling my building so as to make it an above ground storage house. I am insulating it too with paper and matched lumber, putting in 5 or 6 windows, another door and a ventilator in the roof. I want plenty of ventilation so that I can cool the house thoroughly during cool nights. Then I want my walls so that I can hold the temperature down when it becomes warmer outside. What do you know about insulating materials, Professor? They use cork and similar materials in the cold storage warehouses, but I want something cheaper."

THE PROFESSOR: "Dry planing mill shavings make a good insulator as long as they are kept dry. If you were to fill the space between the studding of your house with dry planing mill shavings, it would give you a very good insulation."

LOGAN: "How thick should the wall be for the use of shavings as an insulator?"

THE PROFESSOR: "Six or eight inches gives very fair insulation, but ten inches is really better."

LOGAN: "What size should I build the bins for the storage of the apples. Or would it be better if I stored them in crates or baskets?"

THE PROFESSOR: "The bins should not be too large, and, in fact, most growers store in baskets or crates piled so that there will be free circulation of air between them. No matter what you store in you want a free circulation of air."

LOGAN: "They tell me that a storage house of the type I am building is inclined to be too dry and that apples will shrivel and lose flavor unless moisture is provided."

THE PROFESSOR: "That's right, Logan. The air should be moist enough so that the inside of the house will be a trifle damp, with a little moisture showing now and then on the boards. Too much moisture, on the other hand, will cause mould to start; although I was in a storage house last year in which there was a little mould growing on some of the boards and it did not seem to harm the apples any. This moisture can be secured by sprinkling the floor or better still by setting flat pans of water in the house at the air inlets to give off moisture. The most important thing after all is the proper handling of the fruit, not only should it be free from insect or disease injury, but it must be handled so as to avoid puncturing the delicate skin of the apples or bruising them. Rough handling either in the orchard or at the storage house is sure to bring trouble later.

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U.S. Department of Agriculture

PROGRAM
RELEASE Monday, Oct. 3/27

U.S. RADIO FARM SCHOOL
Southern States

(NOT FOR PUBLICATION)

Crops and Soils Meeting No. 1.

SUBJECT: Harvesting and Storing Sweet Potatoes.

ANNOUNCEMENT: The United States Radio Farm School starts its Fall session today. Each Monday will be devoted to Crop and Soil problems. Each Wednesday will be given to a discussion of Farm Economics and Community Life, and Livestock and Dairy problems will be handled on Fridays. This Monday the farmers in our neighborhood have gathered at the school-house to talk things over. One of them, George Holton, is asking the specialist from the Department of Agriculture how to store sweet potatoes. Let's listen in.

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THE PROFESSOR: Handle them carefully, Holton. That's my advice to you. Sweet potatoes should be handled carefully all through the harvesting and storing process.

HOLTON: I believe you told me that once before.

THE PROFESSOR: Well, I hope you get it. You handle tomatoes and peaches carefully. Sweet potatoes need the same treatment.

HOLTON: That's going pretty strong, Professor.

THE PROFESSOR: Not any too strong, Holton. The success of storing depends to a large degree on the absence of injury. Rhizopus soft rot, by far the most important storage disease, develops almost exclusively through wounds. All the other diseases, particularly surface rot, are aggravated by wounding.

HOLTON: Just what would you call 'careful handling?'

THE PROFESSOR: Well, don't throw two or three rows of sweet potatoes together. Never pitch them into the baskets or containers. Never bruise the roots either in the field, or in hauling, or in placing them in storage. It's best to harvest and store potatoes in hampers or crates. In that way, you reduce the amount of handling -- and wounding. That way, they will not only keep better but have a better color. Or you might store them in ventilated barrels or small bins. You should select varieties demanded by the market and those that have good keeping qualities.

HOLTON: What varieties would you suggest?

THE PROFESSOR: Yellow Jersey, Big Stem Jersey, Nancy Hall, Porto Rico, and Triumph, have good keeping qualities. And remember too, the sweet potatoes must be well matured before harvesting.

HOLTON: What's the best way to tell when they are mature.

THE PROFESSOR: You can tell by breaking a potato. If the fresh surface of the broken sweet potato dries within a minute or two, the crop is ready to be taken out of the ground. The vines also indicate maturity. If there is no disease, the turning yellow of the plants late in the season shows that the crop is ready for harvesting. Of course, you know sweet potatoes should be harvested before the vines are frozen and the ground is chilled. Freezing of the vines often injures the roots, so they are more likely to rot. Exposure to a chilled soil also makes them more liable to decay. Never put spotted or decayed potatoes in storage.

HOLTON: How about Black rot, Professor. Can we get rid of that in the field?

THE PROFESSOR: You certainly can, and you should. The U. S. Department of Agriculture or your experiment station will tell you how to do it. Write to them. And by the way, the U.S. Department of Agriculture has plans with bills of material for new houses for sweet potato storage. Also publications with suggestions for modification of old buildings for that purpose. Just write to the Department for them.

HOLTON: Professor, I understand, that storage houses that have been used for storing sweet potatoes before should be disinfected, to kill off the potato disease germs. What's a good disinfectant?

THE PROFESSOR: Use formaldehyde and potassium permanganate.

HOLTON: Just a minute, Professor. Let me get a pencil. I want the figures on how much to use.

THE PROFESSOR: Ready.

HOLTON: Shoot.

THE PROFESSOR: (Slowly) Use 23 ounces of Potassium permanganate and 3 pints of formaldehyde for each 1,000 cubic feet of space in the storage house. You should disinfect about ten days before harvesting.

HOLTON: Just how do you do that disinfecting?

THE PROFESSOR: Clean the house thoroughly. Clost the windows and make the storage house tight by plugging up any cracks or holes through which the fumigating gas might escape. Also clean the baskets or crates you are going to use for storing the sweet potatoes and put them in the house. Then put a number of large tin or galvanized iron vessels at various points thoughout the storage house. Weigh out the amount of potassium permanganate needed for the house and divide it into equal parts, placing one part in each container. Measure out the correct quantity of formaldehyde for each lot of potassium permanganate and place it in open containers beside the other chemical. When all are ready, pour the formaldehyde into the permanganate of potash in each pail as fast as possible. Begin at the end farthest from the door. Do not inhale the gas. Leave the storage house at once, closing the door. After a couple of days open the windows and doors and leave the windows open for several days to let the gas escape.

HOLTON: After harvesting, you have to cure sweet potatoes, don't you?

THE PROFESSOR: Yes. You can do that by drying them out in the storage house for about 10 days after harvesting. Use temperatures ranging from 80 to 85 degrees Fahrenheit, depending on outside conditions. Have enough ventilation to carry off the moist air. Oil, coal, or wood stoves, hot air or steam heating plants are all used. They should be big enough to keep the temperature up to 80 to 85. The house should be thoroughly dry and warm when you put the sweet potatoes in, so you should have the heat on a day or two before storage begins.

HOLTON: How can you tell when they are cured.

THE PROFESSOR: The potatoes should be dry. The top layers should show some sign of sprouting. After the curing is over, you should cut the heat down to 53 to 55 degrees and keep it there as nearly as possible. Always keep the floor and ceiling ventilators open wide enough to allow circulation of air through the storage house. Never let moisture condense on the inside of the storage house. And place wire mesh over all openings to keep out mice and rats. If you do these things, you can keep sweet potatoes for from 4 to 5 months with very small losses.

HOLTON: Thanks, Professor. I guess that'll save me from having to sell my potatoes from the field when prices are liable to be low. See you later.

THE PROFESSOR: Just a minute, Holton!

HOLTON: Well?

THE PROFESSOR: I don't want any of you men to forget; to handle sweet potatoes carefully.

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U. S. RADIO FARM SCHOOL Oct, 5, 1927

Farm Economics Meeting No. 1.

SUBJECT: The Business of Farming.

ANNOUNCEMENT: The United States Radio Farm School is again in session. Each Monday during the term from now until May 1 the school will take up Crop or Soil Problems. Each Wednesday Farm Economics will be discussed, and each Friday we will talk Livestock or Dairy questions. We are now met for the first of the series of friendly talks on Farm Economics -----By the way, Professor --- What do you mean by "Farm Economics?" ----

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THE PROFESSOR: Farm Economics is just another name for the study of the business of farming. To manage a farm these days, you need boiled down horse sense seasoned with study and science.

Farming is a business that calls for a thousand decisions. Success depends upon making the right decision at the right time. Questions come up every day which force you farmers to make quick decisions on matters which may take a year to work out. To make the right decision, you have to understand the relations of soil to crops, to livestock, to cultivation, and a thousand other relationships.

That's why experience counts so much in farming. It takes a long time to learn the many things you must know to farm successfully. That is why experience is needed in addition to school education to make a good farmer. No book or teacher can foresee the many problems that will come up. Experience and good judgment, combined with learning, is what makes for success.

There are a lot of changes taking place these days. You farmers here will have to adjust yourselves to those changes. That may mean that you will have to move. It may mean that several farms may be combined into bigger farms, or it may mean radical changes in the way you farm. These changes will take place slowly. It's important that you farmers watch for the signs-of-the-times; so that you may make these shifts early enough to avoid loss or disaster.

No guide to successful farming has been found that is better than that suggested by experience; the experience of the more successful farmers in a community. That is why most of the things that have been

learned in farm management have come from studies and surveys of successful and unsuccessful farms.

A Georgia cotton farmer may use only a few acres, small buildings and little machinery, while a Pennsylvania dairy farmer usually has three times as much land, large expensive buildings, more machinery, horses, cows, and needs more labor. The Corn-Belt farmer raising corn and hogs may have fewer acres than the dairy farmer, less expensive buildings, but needs more field machinery. The wheat farmer of the Great Plains uses more acres of land, larger machines, more power, has only a few buildings and relatively few livestock. He needs extra help during the summer, but is not busy during the winter, while the dairy farmer works the year around. The fruit farmer may have fewer acres, but he has a lot of work to do at certain seasons of the year and nothing to do at other seasons.

Each line of farming and each section of the country has its own system of farming. For that reason, you can't say there is any best size of farm, without considering what combination of crops and livestock are to be grown.

You men have farms. You either bought them of your own choice, or inherited them, or leased them. Land in your neighborhood may not be available, so it may not be easy for you to change the size of your farm. You must take your soil as you find it. Your relation to your market is fixed. Probably, the type of farming in your community is definitely determined. For these reasons, it is hard to make abrupt changes in the operation of your place. You must take things as you find them and work out improvements gradually.

Remember, too, conditions are always changing. No plan is permanent. You have to adjust any plan to changing conditions from year to year. If it had been possible to work out a model, uniform system for each community, a system which would always pay, that would have been done years ago. The shifts necessary to meet changing conditions make this impossible. These shifts may take ten years but they are shifts just the same.

For instance, the competition of new producing sections may lower the price of your principal cash crop, so you must gradually change to the production of another crop. Foreign competition also may change prices and bring about shifts. New machinery has its effect, as do changes in market demand through improved transportation. In many cases, these forces are beyond control of the individual farmer. He has no choice but to accept them.

But there are some things you can do. Good farm management begins with an analysis of the conditions surrounding the farm. You must be able to answer some of these questions:

Is all your land being used to produce something? Is each of

your acres producing the crop; either grass, forest, or tilled crop, which is adding to its value? Are you growing the crop that is most profitable in your community? Are you growing crops that will distribute your labor through the season? Is your machinery economical and labor-saving? Are your horses or tractors being applied at the right time to get the work done? Are you keeping livestock that turns raw material into market products economically? Are all your livestock productive? Is there balance between your crop and livestock production which gives you a steady income and profitable employment throughout the year? Are your farms and buildings planned to save work and time? Can the failure of a single crop wipe out your income? Are you keeping records and accounts that show your costs and income for each crop and each animal? Does extra labor cost you too much? Are you producing all that you might of the things that are used on your own farm and in the household? Are you producing the highest grade product which your market demands? Are you keeping informed about price changes and competition in your market? Are you looking ahead to meet the changes that are likely to occur?

These are the sort of questions about which we are going to talk during these meetings. We are going to get the facts to answer them from records collected by the United States Department of Agriculture from upwards of 100,000 farms representing nearly every region of the country. From all of these records and other studies, we have found out a few things that will apply to almost any farm.

UNITED STATES DEPARTMENT OF AGRICULTURE

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SEP 26 1927
U. S. Department of Agriculture

PROGRAM .... RELEASE ....

U. S. RADIO FARM SCHOOL   Friday, Oct.7/27.

(NOT FOR PUBLICATION)

LIVESTOCK MEETING NO. 1.

SUBJECT: Economical Feeding.

ANNOUNCEMENT: This is livestock day at the United States Radio Farm School, which meets Monday, Wednesday, and Friday of each week. Farmers of the neighborhood have met at the school house to talk things over, and maybe get the Professor's expert advice on some of their own problems. John Dale is the man who is talking to the Professor there now.

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THE PROFESSOR: Yes, John, there's a big chance to save money in the way you feed your livestock.

JOHN: How you figure that, Professor?

THE PROFESSOR: Well, just stop and think. One-half to three-fourths of the total cost of producing a pound of beef, pork, mutton, or a dozen eggs is for the feed that the animal eats.-------

JOHN: Yes, Professor, feed costs like sixty, too, but there's no way to grow livestock without it.

THE PROFESSOR: Don't forget, John, that every dime's worth of feed that a shoat wastes while he is growing or fattening, adds at least a nickel to the cost of the pork he produces.

JOHN: There's not much feed wasted on my farm.

THE PROFESSOR: I'm glad to hear it, because you must feed better than most of the farmers around here; and better than I thought you did.

JOHN: Why, don't you know, Professor, my hogs clean up their troughful of slop each feeding time almost before I can back out of the pen and close the gate! Yes, sir. When I feed them corn, they eat all in sight. Then they go rooting around for the lost grains. It's the same with the horses and cows. Each time, I open the barn door, my horses whinny for hay or oats. My cows go after their silage rations like a bunch of hungry boys after cookies. Where's there any chance for me to save money on feeding?

THE PROFESSOR: Nevertheless, John, as I said before, there is much good feed being wasted on many livestock farms. In many cases, it's within the farmers' power to stop the loss.-----Do you have any scrub cattle, John?

JOHN: Y-yes, I've got a few scrubs.

THE PROFESSOR: Then you're wasting feed.

JOHN: How you mean?

THE PROFESSOR: If the farmer who keeps scrubs or inferior animals compares his profits with those of another farmer who keeps purebreds and feeds them in the same way, he will find that scrubs waste feed. A canvass of livestock feeders in many parts of the country shows that the purebred-stock farmer makes a third more money with an equal number of animals fed the same way. Good breeding pays.

JOHN: I never thought of that.

THE PROFESSOR: Yes, and some of you never seem to realize that wasted energy also means wasted feed. A farmer is wasting feed if his cattle and horses have to spend a big part of the day fighting flies. Fly repellants applied often will more than pay for themselves in the energy and blood they will save. Animal energy uses up feed just as mechanical energy expends coal or gas or electricity. Why, it even takes a third more feed to keep an animal while standing on its feet than while lying down. I'm not mentioning any names, but I know a rough, careless farmer, not a thousand miles from here, who runs up a big, unnecessary feed bill on himself every year by rough-handling his livestock. He has a snarly, meddlesome dog that helps him do it, too. He doesn't seem to realize that fretful, uncomfortable livestock never do well.

JOHN: But livestock need some exercise, don't they?

THE PROFESSOR: Yes. A certain amount of energy and exercise, used up in a natural way, prevents an animal getting overfat or losing appetite. I don't mean that an animal should not have to hustle and rustle for its feed, at times.

That reminds me of Ed Holmes. Ed complained that his flock of hens wouldn't lay any eggs. He fed them generously; but they just got waddling fat and refused to lay. One day, when Ed expected company, he put two of the hens in the woodshed, where they would be handy for killing. The company didn't come, so he decided he would keep the hens penned in the woodshed until Sunday and have them for dinner -- company or no company. Sunday came and with it word that the company would arrive the following week, so the hens were again spared. Finally when Ed went to the woodshed, axe in hand, he found one of the hens on a nest she had made in an old stove. There were five eggs in the nest. Those eggs saved that hen, and taught Ed a lesson. While they had been penned up, they had had to scratch deep down into the shavings for the little grain that had been tossed to them. The scratching worked off their surplus fat and got them into laying condition.

On the other hand, as some of you realize, no gain means a loss. Not long ago, I was out to Dave Meek's place. I was looking over his drove of hogs, and he began to apologize for their looks. "They're a little thin now," he said, "I guess I'll have to throw them a little more grain."

"Look here, Dave," I said, "that kind of feeding will cost you most in the long run. Don't you know that weight once gained by an animal, and then lost, can never be put back on as economically as it was gained in the first place. The growing animal which "goes to bed" at night without having made some gain during the day has wasted what feed has been given it that day."

But I cautioned him not to go to feed too much. A growing animal should be kept alert. If it doesn't seem to relish the feed given it, something is wrong.

JOHN: That's one mistake I don't make. My animals are generally keen for more feed.

THE PROFESSOR: That's the way to have them, John.

JOHN* At that, Professor, I think you've given me some good suggestions. I guess there is some chance for me to save on feed. I'm going to weed out the scrubs. I'm going to be more careful that my stock don't waste feed by wasting energy. And I'm going to try to keep them gaining steadily, without any set-backs.

THE PROFESSOR: You'll find it pays, John. And I want all you men to realize that the stockman who profits most year in and year out, other things being equal, is the stockman who uses the greatest proportions of feeds grown on his own farm, has plenty of pasture, and keeps pure water before his stock at all times.

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UNITED STATES DEPARTMENT OF AGRICULTURE
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U. S. RADIO FARM SCHOOL Mon. Oct. 10, 1927

(Not for Publication)

Crops and Soils Meeting No. 2

Subject: Apple Scald.

ANNOUNCEMENT: The United States Radio Farm School is now in session. We hold meetings three times a week; Mondays, Wednesdays, and Fridays. At these meetings, the farmers in our neighborhood talk over their farm troubles with an expert of the Department of Agriculture. Today they seem to have gotten on the subject of apples. Dave Smith has been telling about his losses from apple scald. Now then, Fred Hawkins is speaking up------

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HAWKINS: Dave is not the only one, Professor. I lost considerable myself last year, putting my apples in cold storage.

THE PROFESSOR: Well, we know how to control that now. I want to tell you men how to prevent apple scald. It's an important thing. Apple scald causes big losses all along the line, to growers, wholesale dealers, and consumers. A big part of the commercial crop of winter apples is put in cold storage. Although apples are perfectly good when they are put in storage, they may come out with that browning of the skin----

HAWKINS: Yes, some of mine were brown deep down into the flesh for an eighth to a quarter of an inch or more. They were okay when they went in.

THE PROFESSOR: Oh, yes. It's not caused by fungus or other parasites. It's due to conditions in the environment of the fruit itself; to storage conditions.

HAWKINS: I had some that were all right when I took them out of storage. The scald didn't show up until several days after we had them out of cold storage.

THE PROFESSOR: Yes, that's generally the case.

HAWKINS: There's a lot in the kind of apple, too.

THE PROFESSOR: Yes, All varieties are not equally affected. The ordinary Winesap, the Yellow Newtown or Albermarle Pippin are good keepers. On the other hand, the Mammoth Black Twig and Paragon, which are naturally late apples and would otherwise be long keepers, are apt to be very seriously affected. The York Imperial, one of the great varieties of the Eastern States from Pennsylvania southward, is notably bad for scalding.

HAWKINS: The green side of partly colored apples is more affected than the better colored sunny side.

THE PROFESSOR: Yes, that's right.

HAWKINS: What I don't understand is why the same sort of apples scald in a cold storage plant and may not scald in a common storage.

THE PROFESSOR: That was a mystery to all of us, but now we know. The scalding is caused by the apples gassing themselves.

HAWKINS: What do you mean, 'gassing themselves'?

THE PROFESSOR: Just that. We've found that the gasses given off by the live apple in its slow breathing process while in storage cause the disease. We even know which of the gasses cause the trouble. As a result of numerous experiments, we found that when apples are shut up in tight packages, such as barrels or boxes, and then shut up in tight storage rooms, so much of the damaging gas accumulates that the skin is slowly poisoned. When in the low temperature of the storage house, 32 to 33 degrees Fahrenheit, discoloration and visible evidence of death take place very slowly. But when the apples are brought out into warm temperatures these already poisoned cells on the skin or even in the flesh of the apple below the skin die and collapse rapidly and discolor. Then you get that well known effect of apple scald.

HAWKINS: As I understand you, scald is caused by the apples being shut up too tight, so they get poisoned by their own breath, as it were.

THE PROFESSOR: That's right.

HAWKINS: Then why not open them out and ventilate them?

THE PROFESSOR: That is exactly what has been tried and found fundamentally sound, but ordinarly it's not practical. That explains why the apples in common storage in bins, barrels, boxes, crates, etc. usually excape the scald entirely. In fact, scald was not known except in large bins or closed houses before the tightly sealed cold storage house came into. use. We tried experiments in ventilating the apple barrels by boring a number of holes in them and by storing the apples in slatted crates. Fruit in such packages does have less scald, but the trouble is the tightly sealed storage rooms of cold storage houses accumulate so much of the poisonous gas as to still make the apples scald.

HAWKINS: Why not ventilate the storage house as well as the packages, Professor?

PROFESSOR: That's been tried too, but it's not altogether practical. The cold storage house has to be tight to keep the temperature down. Then too much ventilation is not good for winter apples. If you give the apples

plenty of air, they won't scald; but they will wilt and won't keep properly. If you put them in a tight cold storage room which will keep a low temperature then they scald.

HAWKINS: That certainly looks like a tough propositon.

THE PROFESSOR: Yes, but we've solved it. There is a reasonably cheap and comparatively simple remedy. It's based on the well known principle that fats and oils will absorb these particular gasses which cause apple scald. The remedy consists in wrapping the apples in oiled paper wraps. All the better grades of the boxed apples of the western half of the United States were already wrapped in paper wraps. By adding at least 15 to 20 per cent of an inert inodorous mineral oil a bit lighter than light lubricating oil we devised an oiled paper wrap which protects the apple from scald. Oil manufacturers and paper factories have cooperated. The actual cost to the growers for the additional oil in the wrapper is only about two cents a box of packed apples.

HAWKINS: But what about the barrel apples that are not commonly wrapped?

THE PROFESSOR: For barrel apples we use the same type of oil paper, only shredded; in half inch wide strips from 5 to 7 inches long. One and a half pounds of shredded oil paper evenly distributed through the apples serves the same purpose as the oil-paper wraps and protects the apples from scald. If yousee barrels of apples with these shreds of oiled paper you can know it has protected the fruit from scald and made it a better quality. It only costs the barrel apple man about 22 to 25 cents a barrel. You can see the saving. A scalded barrel of apples is likely to be discounted one or two dollars a barrel.

HAWKINS: That oil paper acts about like those gas masks we had to wear at the front in the World War.

THE PROFESSOR: Yes, In a way, the principle is the same. Only in the case of apples, the mildly poisonous gas comes from the apple itself instead of from outside.

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PROGRAM U. S. RADIO FARM SCHOOL Wed., 10/12/27

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Farm Economics Meeting No. 2.

Subject: Analyzing the Farm Business.

ANNOUNCEMENT: This time last week we were at a meeting of the United States Radio Farm School at which the Business of Farming was discussed. Now the crowd has gathered around again. There's the Professor over there. He said last time that the Department of Agriculture had found out things that would apply to most any farm any where. There's John Logan, old Dollars-and-Cents Logan we call him. He's evidently got something on his mind. There he goes now. Let's listen.

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LOGAN: Professor, as I understand you, the Federal Department of Agriculture has worked out a method of analyzing the business of a farm; so it's easy to find out the strong and weak points.

THE PROFESSOR: Yes. The Federal Department of Agriculture and some of the agricultural colleges and experiment stations have worked out such a method. Several thousand farmers are using it each year. They find out their strong and weak points. Then they try to strengthen the weakest points.

LOGAN: Well, just how do they go about it? Just what is this method anyway?

THE PROFESSOR: The first thing is the farm inventory.

LOGAN: What do you mean, 'farm inventory'?

THE PROFESSOR: A list of the amount and value of all farm property, land, buildings, machinery, and livestock, made at the beginning and then again at the end of the farm year. In any method of analysis the farm inventory is important. It shows whether the business has increased during the year. You can't tell whether the year as a whole has been profitable unless you take an inventory before and after.

LOGAN: Huh! Maybe not --

THE PROFESSOR: For instance, you may be discouraged because last year's sales didn't bring in as much as your year's effort and operations would justify, but there may have been considerable growth and increase in the number of your livestock, which haven't been sold yet. On the other hand,

without an inventory you may be fooled into thinking that your business has been paying well. But your high returns may have been due to sales of livestock which has been growing in value for two or three years, and had made most of their growth during previous years.

Not only should you make an inventory of the amount and value of all farm property, such as land, buildings, machinery, and livestock, but you should keep a crop record too.

LOGAN: You mean a record of the acreage and yield of each crop?

THE PROFESSOR: Yes, and the amount and value of sales from each crop. We don't include crops fed to livestock on the farm as sales, but crops held from the previous year for feeding on the farm are inventoried as feed held for the next year's business. Then next comes the livestock record.

LOGAN: What does that include?

THE PROFESSOR: That includes the number and value of each kind of livestock at the beginning and end of the year, and all sales and purchases within the year, as well as the amounts and values of all livestock products sold, such as milk, butter, eggs, wool, etc.

LOGAN: What about the products you exchange for groceries?

THE PROFESSOR: Treat them as receipts of the farm. The principle to follow in recording the year's farm receipts is to include the value of all farm products leaving the farm whether sold or given in exchange for something else.

LOGAN: Well, Professor, sometimes I get money for man or team work, or for the hire of my machines for work done off the farm.

THE PROFESSOR: You should record such money as receipts from your business. The receipts from outside work, from the sales of crops, livestock, and other products, together with the increase shown in the general farm inventory will be your farm receipts for the year.

LOGAN: But there are a lot of expenses on a farm --- I suppose to know how much you've made during the year, you'd keep a list of the expenses and subtract that from your total receipts.

THE PROFESSOR: Exactly. We consider farm expenses under five main divisions; current expenses, family labor, decrease in value of feed, decrease in value of livestock, and depreciation on buildings and machinery.

LOGAN: What do you call 'current expenses?'

THE PROFESSOR: Current expenses include money paid out for labor, for repairs of machinery, buildings, fences, etc. and for such other items as seeds, fertilizer, horse shoeing, veterinary fees, insurance, and taxes.

LOGAN: How do you figure on the work done by members of the family; work that's not paid for?

THE PROFESSOR: That's usually figured on the basis of what it would cost to have the same work done by hired labor.

After you find the amount of your farm capital by means of your farm inventory, and get the farm receipts from your crop, and livestock, records, and obtain a record of the farm expenses, you can tell what you have earned on your own work and on your capital by subtracting the farm expenses from the receipts.

That's what is called Farm Income. It does not include the value of any of the family living which is obtained directly from the farm. After you have determined your farm income, you should subtract from it a fair rate of interest for the use of the capital. That will give you what we will call "Labor Income."

Now, with the labor income you can compare one farm in a locality with another as to size of the income. That's what we have done with a large number of farms. In doing this we've found out a number of things which materially affect the success of the organization and management of a farm.

LOGAN: What are the things you've found which make for success?

THE PROFESSOR: There are four things, Logan. First, size of the business; Second, yield of crops; Third, returns from livestock; and Fourth, the efficiency of your labor. There are many other factors which have their influence and must not be overlooked on a given farm, but in a majority of instances, the farms which are above or better than average of the community in these things are generally successful.

LOGAN: You mean a farm may be too small to pay well, even when yields are good?

THE PROFESSOR: Yes. Or yields may be too low to leave a satisfactory margin. Or the livestock may not be returning products or gains in return for the feed and work so there is no net income, or if the labor is not used efficiently your expenses may exceed your income and leave you no balance. We'll talk about each of these things later.

What I want to emphasize now, is that if you want to know instead of merely guess whether or not your farm is paying, you must record your receipts and expenses, and make a complete farm inventory at the beginning and end of each farm year.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

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PROGRAM U. S. RADIO FARM SCHOOL RELEASE Fri. Oct. 14, 1927.

RECEIVED ★ U.S. Department of Agriculture

(NOT FOR PUBLICATION)

Livestock and Dairy Meeting No. 2.

Subject: Feeding Dairy Cows in Winter.

ANNOUNCEMENT: Here are the neighbors meeting in the school house again. Every Monday, Wednesday, and Friday they meet with an expert of the Department of Agriculture to talk things over. They've agreed to give Fridays to discussing livestock or dairy problems. That man over there sharpening his pencil is Henry Graham, our new dairy farmer. Now he's talking to the Professor. Listen to him.

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GRAHAM: Yes, Professor, I'm getting ready to list those cow rations you're going to give us. We want you to tell us the best feed for our dairy cows?

THE PROFESSOR: Well, Henry, you can't beat the green grass. Good pasture furnishes a well balanced feed. It is succulent. It has a good effect on the digestive system and general health of the cows. It also has the necessary minerals, in a form easy for the cows to use.

GRAHAM: Sure. But from now on until spring the cows can't do much foraging for themselves. We want to know about the hays, silage, and grain we should feed this winter.

THE PROFESSOR: I'm glad you brought that up, Henry. The rations need especial attention when you change from summer pasture to winter feeding conditions. All feeds are not equally good to meet a dairy cow's needs. To feed a cow properly, you should know what feed she needs and how she uses what she gets.

GRAHAM: Sure. That's what I was asking about.

THE PROFESSOR: Well, you know a cow uses most of her feed for up-keep and for milk production. She must have feeds that can be converted by the processes of digestion and assimilation into body heat, energy, muscles, bones, body organs, body fat, and milk. Milk, you know, contains butterfat, proteins, sugar, and minerals. In order to meet these needs, the cow should have feeds containing rather definite amounts of the feed nutrients known as proteins, carbohydrates, fats and minerals. The proteins supply the larger part of the feed nutrients needed for growth, muscle, body organs, and the proteins of milk. Carbohydrates and fats supply the larger part of the feed nutrients needed for body heat, energy, body fat, butterfat and milk sugar. The minerals in the feed supply most of the nutrients necessary for the growth of the cow's skeleton and for the minerals in the milk. Proteins and minerals are the things which are apt to be lacking, but you can get plenty of them in ordinary feeds, if you make the proper selection.

GRAHAM: What is the proper selection? What's the best kind of hay and grain?

THE PROFESSOR: Well, properly cured legume hays, such as alfalfa, clover, vetches, soy beans, and cowpeas are well suited for winter feeding dairy cows. They are high in both protein and minerals. They are also very palatable. They are much better than nonlegume hay, such as timothy, prairie hay, millet and corn fodder.

GRAHAM: How about silage and stored root crops for roughage?

THE PROFESSOR: They're fine when there's little or no green grass. They are especially valuable in keeping the cow's digestive system in good working order and in stimulating milk flow.

GRAHAM: What I want most is a good grain ration. What do you say is best?

THE PROFESSOR: The grain ration will depend on the kind of roughage feeds your cows are getting? Corn, oats, barley, and kafir are farm-grown grains commonly used in feeding dairy cows. Wheat, rye, emmer, or speltz and rice are sometimes fed when they are available. All these feeds should be ground before feeding. They are classed as carbohydrate feeds. To supply all the protein required by the dairy cow, you should supplement these feeds with high protein feeds.

GRAHAM: What would you call high protein feeds?

THE PROFESSOR: Such feeds as wheat bran, linseed oil meal, cottonseed meal, corn-gluten meal, corn-gluten feed, and peanut meal.

GRAHAM: When we feed legume hays we won't need to feed as much of the high protein feeds as when we feed nonlegume hays, will we?

THE PROFESSOR: That's right. But remember wheat bran, linseed oil meal and cottonseed meal are high in phosphorus, which is not very plentiful in other feeds. And although wheat bran does not contain as much protein as most of the other protein feeds, it is bulky, cooling, and laxative in effect. You should include wheat bran in the grain ration whenever it's practicable.

GRAHAM: Cottonseed meal and linseed oil meal are pretty heavy don't you think?

THE PROFESSOR: Yes. You should mix them with bulky feeds, such as wheat bran and ground oats, so as to lighten the mixture, and make it more digestible.

GRAHAM: Just how much would you feed a day? How much roughage, for instance?

THE PROFESSOR: If you feed a cow hay alone as roughage, you should feed her about 2 pounds of hay for each 100 pounds live weight. If you feed both hay and silage, give 1 pound of hay and 3 pounds of silage for each 100 pounds of live weight.

GRAHAM: Just a second, Professor, let me get that down.

THE PROFESSOR: (More slowly) If you feed roots instead of silage, 3 pounds of sugar beets or 6 pounds of mangels per 100 pounds live weight will be enough. Feed grain at the rate of 1 pound a day for each 3 to 4 pounds of milk produced. You should feed dry cows grain if necessary in order to get them in good flesh before calving. Usually 4 to 6 pounds of grain a day will be enough for heifers calving the first time, and 6 to 12 pounds a day for older cows. Here's a good grain ration to feed with alfalfa or other legume hays. (Slowly) 400 pounds ground corn, 100 pounds cottonseed meal, 100 pounds gluten feed, and 100 pounds wheat bran. Or, in case you want a grain ration to feed with low protein roughages such as timothy, prairie hay, millet, sudan-grass, or corn fodder, you might try this. 100 pounds ground corn, 100 pounds choice cottonseed meal, 100 pounds old process linseed oil meal and 200 pounds wheat bran.

GRAHAM: How about a grain ration to feed with combinations of high and low protein roughages?

THE PROFESSOR: Well, here's one. Ready? (Slowly) 100 pounds ground corn, 100 pounds ground oats, 100 pounds prime cottonseed meal, and 100 pounds wheat bran.

GRAHAM: Do you use any salt with those rations. Dairy cows need plenty of salt, don't they?

THE PROFESSOR: They certainly do. You should mix one-half to one pound of salt with each 100 pounds of grain. Put out more where they can get it when they want it. They also need plenty of pure water, where they can drink it when they want to. You know, Henry, water makes up more than three-fourths of the volume of milk.

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U. S. RADIO FARM SCHOOL

Mon. Oct. 17/27.

(NOT FOR PUBLICATION)

Crops and Soils Meeting No. 3.

Subject: The Soil Survey.

ANNOUNCEMENT: It looks like our community club to talk over farm problems is coming along nicely. We've been meeting in the school house here three times a week. Each Monday we're supposed to talk either crop or soils matters.------There's the Doctor, from the Department of Agriculture now. Hines suppose you ask him that question you put to me awhile ago------

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(Sound as of rapping on desk)

THE DOCTOR: Let's have a little order, so we can all hear better. What's on your mind, Hines?

HINES: Doctor, what is the Soil Survey? What does it do?

THE DOCTOR: Well, first it does fundamental research work. The soil scientists tear the soil apart, as it were, to determine its inner secrets. Its characteristics ---

HINES: That's all right, I guess. But information about soils in general is not much practical value to me. I don't want to know about what some other soil is like. I want to know about the soil on my own farm.

THE DOCTOR: You are exactly right, Hines. I was coming to that. Your need for knowledge of the soil on your own farm, or the farm you're thinking about buying, is exactly the requirement of soil investigation that is being met by the Soil Survey. The Soil Survey is the only institution that undertakes to investigate the particular soil which each farmer cultivates. In doing this it needs and must have the help of the laboratory worker. Both field and laboratory workers are necessary.

HINES: How do they investigate? How do they go about it?

THE DOCTOR: Well, a field party usually consisting of two men is assigned to an area, usually a county.

If a good map of the area is available, it is used as a base on which to show the soil. If no good base map is available, the field party must make one. This map must show the county, township, the section lines and streams, roads, railroads, houses, towns, schools, churches, cemeteries and other permanent objects.

Once they have the base map, the field party proceeds to make a close examination of the soils. The soils are exposed either by digging a trench, cutting away a roadside bank, or by making auger borings.

If the soils are found to be similar to type found elsewhere, they are named and their position is indicated on the map. Samples of each type are carefully taken and sent into Washington for mechanical and chemical analysis.

HINES: Those chemical analyses show what the soils need, don't they?

THE DOCTOR: Not by themselves. So many other things influence production that chemical analyses in many cases are of little use. In certain places of the western states, however, the amount of alkali in the soils is very important. This is found by field tests and estimates made as to what parts of them now have or may, in the future, have enough alkali to injure crops.

HINES: Are the soils on those maps classified so an ordinary farmer like myself can tell anything about them?

THE DOCTOR: Yes. The soils are classified and mapped on their common properties which may be recognized by any farmer if he knows what to lock for.

HINES: What are those properties?

THE DOCTOR: Texture, or the fineness or coarseness of the soil; color; character of the subsoil, whether clay, hardpan, or gravel; the amount of lime in the soil; and the character of the substrata or the material from which the soil has weathered.

HINES: Just a minute, Doctor! About that texture --- What do you call a fine or coarse soil.

THE DOCTOR: Texture refers to the size of the individual soil grains or particles. We grade the soil according to the fineness. The coarsest grade is sand. The finer grade is called silt. And the soil with the finest particles we grade as clay. A loam is a soil with a relatively even mixture of sand, silt, and clay. Loams with a larger amount of sand compared to silt and clay, are called sandy loams. Those with a larger amount of silt are named silt loams. While the loams in which clay predominates are designated as clay loams.

Color is a very important feature of the soil. It shows the make-up and history of the soil. A dark color in the surface soil nearly everywhere shows a large amount of organic matter, as you know. A light yellow soil usually indicates a deficiency. Brown and red subsoil colors show well drained soils. Mottled or gray subsoils are indications of poor drainage conditions. Certain soil color indicates a leached or unproductive condition.

HINES: How much of the country has been mapped to show the types of soil?

THE DOCTOR: More than one-third of the total land area of the United States and considerably more than one third of the tillable land. You understand, the States cooperate in this work. Nearly every State in the Union has worked with the

National Government in making these surveys.

HINES: And the maps made by the Soil Survey show the location, area, and characteristics of every soil in the area covered by the map.

THE DOCTOR: Yes, The Soil Survey, has not only determined what soils in certain localities in Indiana, for instance, produce good yields of corn, but why they do it, where the soils are, as far as the mapping has gone to date, and over how much of an area those soils extend. It has found out why some soils in the United States must have fertilizers to produce even a fair crop, why others need fertilizers only to enable them to produce a good crop, and why still other soils do not need fertilizers at all. It has also determined the general distribution of each of the different kinds of soils. The Soil Survey is gathering data and has already obtained enough to tell what soils in the United States are best for corn, wheat, cotton, apples, citrus, clover, and why they are so adapted; and how to treat other soils so they will produce these crops.

HINES: That certainly will be a big help.

THE DOCTOR: Yes, the soil survey is of value to the individual farmer because it classifies the agricultural and non-agricultural land and shows the areas which are best adapted to special crops, and the areas best suited to intensive cropping systems. It's especially valuable to farmers who are seeking new locations and to city folks who are interested in buying farm land.

You should remember that in order to use your soil intelligently, you must know its characteristics.

HINES: Where can we get these maps and soil survey reports?

THE DOCTOR: Through your county agent or by writing direct to the Bureau of Chemistry and Soils of the United States Department of Agriculture.

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Wednesday Oct. 19.

U. S. RADIO FARM SCHOOL

(NOT FOR PUBLICATION)

Farm Economics Meeting No. 3.

SUBJECT: The Size of the Farm Business.

ANNOUNCEMENT: Here we are again in the school-house for our weekly talk about the farming business. You remember last week the specialist of the Department of Agriculture explained how to take an inventory and analyze the business, so you can tell where you stand. The most important factors in the financial success of a farm, he said, are the size of the business, crop yields, livestock returns, and efficiency of labor ---- But there's Bill Stewart and Logan over there trying to figure out something. Now they're going to get the Doctor in on it. Let's see what the argument is about -----

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LOGAN: Why, how do you make that? No two farms are alike -- at least, not exactly alike.

STEWART: No, but it stands to reason, unless a farm is running at a loss, the bigger the business the bigger the returns you'll get from it, other things being equal. Isn't that right, Doctor?

THE DOCTOR: It certainly is. Our figures show that. As the size of the business increases labor income goes up.

LOGAN: What do you mean "labor income"?

STEWART: That's what you really earn for your work as a farmer, isn't it, Doctor?

THE DOCTOR: Yes. That's what you get after subtracting the farm expenses and a fair rate of interest on your capital from the farm receipts; not counting any of the family living which you get directly from the farm.

LOGAN: And you say that if that "labor income" is bigger, the bigger the business?

THE DOCTOR: Yes.

LOGAN: Just what kind of farming are you talking about? And where were the farms?

THE DOCTOR: In several localities of the United States. It is generally true that business increases as labor income goes up wherever the locality and whatever the type of farming; providing, of course, that it is not an unusually bad year.

UNITED STATES DEPARTMENT OF AGRICULTURE

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THE DOCTOR: In several localities of the United States. It is generally true that business increases as labor income goes up wherever the locality and whatever the type of farming; providing, of course, that it is not an unusually bad year.

For instance, a good 80-acre corn and hog farm in central Indiana had a $757 labor income for an average of eight years; a 120-acre farm had a $1332 labor income; a 160-acre farm $1632; while a 240-acre farm gave a labor income of $2356.

Out near Madison, Wisconsin, a good 8-cow dairy farm averaged $252 labor income for five years; a 16-cow farm averaged $598, and a 32-cow farm $997.

In western Washington, a labor income of $391 was made on a poultry farm with 750 hens, and $665 on one with 1500 hens.

A good apple farm in the Shenandoah Valley of Virginia with 25 acres of bearing orchard averaged $988 labor income for five years; one with 50 acres of bearing orchard $1878, and one with 75 acres, $3785.

In southwestern Georgia, one of the better cotton plantations with 100 acres of tilled land made a labor income of $2204 in 1918, one with 200 acres made $4177, and one with 300 acres made $5948.

STEWART: Then by the size of the business, you don't mean the number of acres of land in the farm?

THE DOCTOR: Not necessarily. Of two farms in a given locality, each with the same number of acres, one may have a much larger business than the other by using more of the land for crops, by growing more intensive crops, or by keeping more livestock. A few acres of truck crops or of fruit may represent as big a business as many more acres of grain and hay crops. Or a few high producing dairy cows, or a few hundred chickens may represent as big a business as many more animals of the general livestock farming type. In some instances, the number of acres of land in the farm is a good measure of the size of the business; in others the number of acres of crops is better. In some the number of dairy cows or hens is better; and in others the number of acres of bearing orchard or grove.

LOGAN: Well, Doctor, would you say every farm should be a big sized business?

THE DOCTOR: No. There are limits to the size of a farm business that any given man has the ability to operate. But, on the other hand, there are many farms in the country with too small a business to reasonably expect big enough return to well support a farm family. In a locality in central Indiana, where the eight-year average annual receipts were $3007 per farm, eight of the farms had less than $1000 receipts. After subtracting the expenses of operating the farms seven of them netted less than $500 for the farmer's labor and capital. The receipts from 40 of a group of 97 farms in a locality in the hills of southeastern Ohio were less than $500 in 1926, and from 29 of a group of 50 farms in a locality in middle Tennessee were less than $500 in 1925. To farmers in such groups, I'd recommend an increase in the size of their business.

LOGAN: You mean for them to buy or rent more land?

THE DOCTOR: That's sometimes necessary, but not always advisable. Take a group of 22 farms in a locality in middle Tennessee which had fewer acres of land in crops than on more successful neighboring farms. 14 of those 22 could have reached the crop acreage of the more successful farms without buying or renting more land. Some could have done it by using the available idle crop land. Some by using a little of the pasture land. And some could had increased the business by clearing some brush land that is not producing much at the present time.

You might increase your business by growing crops needing more labor or you might follow a more intensive form of farming. A farmer in the hills of southeastern Ohio increased his business by having a few acres of apple orchard from which he sold on the average $50 of apples per acre each year. A farmer in central Indiana increased his business by growing a few acres of tomatoes for canning.

Another way you might increase your business is by adding more live-stock. A farmer in central Indiana increased the size of his business by feeding all the crops produced on his farm and $657 worth of purchased feed. A dairy farmer in eastern Pennsylvania increased the size of his business by adding a few more good cows and buying feed in addition to what he could raise.

A third way of increasing the business, is by doing work outside the farm. A farmer in the hills of southeastern Ohio with a limited amount of land increased the size of his business by doing some team work in oil fields, and another by working on the roads.

There's usually a chance in every locality for many of the farmers whose business is very small to in some way or another increase it to a size big enough to reasonably expect a fair return for the farmer and his family.

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U. S. RADIO FARM SCHOOL Fri. Oct. 21/27.

(NOT FOR PUBLICATION)

Livestock and Dairy Meeting No. 3.

Subject: Feeding for Beef.

ANNOUNCEMENT: Is everybody here? There's the bunch from out our road. Those farmers over there by the stove must be from out the other way. These meetings in the school-house are getting popular. This is the third week now, and we meet three times a week; Monday, Wednesday, and Friday. Friday is the day we talk either livestock or dairy problems--- Who's that over there talking to the Department of Agriculture man. Let's move over where we can hear a little better.**

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SMITH: So you think feeding cattle for beef would be a good idea for me, do you, Doctor?

THE DOCTOR: It's certainly one of the most practical ways of disposing of that grain and roughage you are producing on your farm, Smith. Cattle will eat to advantage a bigger proportion of coarse roughages such as straw and corn stalks than any other farm animal. They are a very convenient means of marketing, in a concentrated form, crops which are too far from market to pay for transportation in their bulky form. Don't you find it that way, Hall?

HALL: You're right, as usual. And not only that, but feeding for beef makes for diversification in farming and makes it so you can spread your labor out over the year better.

SMITH: How so?

HALL: Well, it doesn't take much work to handle cattle on pasture stubble and stalk fields, while you're busy producing or harvesting crops. Then you can fatten them on the harvested crops during the winter when there is not much field work to do. I just divide mine up and turn them in my corn fields. They do a clean job of harvesting the corn and are ready for market when the job is finished.

THE DOCTOR: You might mention too, Hall, that feeding operations keep up soil fertility.

SMITH: How you mean?

THE DOCTOR: As you probably know, Smith, about 75 per cent of the fertilizing constituents of feeds fed to cattle is returned in the manure. When you save the manure and put it on the land, you keep the soil fertile.

HALL: Yes, and where you have the cattle on pasture or graze them to eat down cultivated crops, you don't have to pay for labor to distribute the manure.

THE DOCTOR: Yes. You can get the same result in feeding harvested crops when it's practical to feed in the fields and move the bunks from place to place so as to cover the field during the feeding operations. In lot feeding, however, either a paved lot and cistern, covered shed, or good deal of bedding and continual hauling and spreading are necessary to save all the manure.

Of course, you realize, Smith, that ability in buying and selling cattle and in combining feeds properly is largely responsible for success in beef-cattle feeding. The supply of feeder cattle and the demand for fat cattle vary considerably during the year. To make the most economical use of their feed, cattle need a complete ration; one that supplies all the needs of their bodies.

SMITH: Just what is a good, cheap ration for fattening cattle?

THE DOCTOR: Corn, soy-bean meal, corn stalks and clover hay, or similar feeds are good. Corn and grass which is eaten down or mowed so that it can not produce seed is one of the best-balanced and most economical rations.

SMITH: How about dry-lot feeding?

THE DOCTOR: Well, there are various rations used in dry-lot feeding. Two combinations of feeds stand out rather prominently. Where there is plenty of legume hay, such as clover and alfalfa, the standard ration is corn and hay. Where legumes are less abundant, silage and a protein meal, such as cottonseed or linseed meal, are fed in combination with corn and a mixed hay.

Understand me now, starting steers on feed requires careful management. For success in getting steers up to full eating capacity, you must watch your cattle carefully and gradually increase the quantities of feed in the ration.

SMITH: How long does it take to get them up to full capacity?

THE DOCTOR: That depends on the feeding period and the age of the cattle. The feeding period for 2-year-olds varies from 5 to 7 months. Older cattle fatten in a shorter period. Younger cattle take still longer. Suppose you were going to feed 2-year-olds a corn-and-clover ration for 6 months, In that case, it is good practice to increase the quantities of feed gradually; so the cattle will be on full feed in not less than 30 days.

SMITH: Just how would you increase the feed?

THE DOCTOR: Here/is a safe way to handle the feed. Start with -----------

HALL: Just a minute, Doctor!

THE DOCTOR: What's the matter, Hall?

HALL: I just want to take down what you going to say. Now I've got a pencil. All right?

THE DOCTOR: (Slowly) Start with 2 pounds of corn the first day. Increase 1 pound a day until 10 pounds is reached.

SMITH: Two pounds to start, and one pound a day, until you're feeding 10 pounds. All right.

DOCTOR: Hold at this amount for four days then increase 1 pound every three days until 20 pounds is reached. That will be in about 40 days.

SMITH: How about the roughage?

THE DOCTOR: Steers can receive all the roughage they are able to eat from the beginning without any bad effects. When protein concentrates are used in the fattening ration, increases should be even more gradual than with corn.

SMITH: How much to start with?

THE DOCTOR: A conservative quantity of protein meal to start two-year old cattle on would be half a pound.

Now then, bear in mind, that quality in feeder cattle favors economical production. Uniformity and quality combined invariably mean higher selling prices. And in selecting your feeders, you should consider age, weight, conformation, quality, condition, thriftiness, and uniformity. Older cattle use roughages more advantageously, while younger make the most economical use of all their feed. The younger cattle must be fed longer than older cattle to get the same degree of fatness, because mature cattle don't have to also grow as well as fatten. The better the steer the more economical use he will make of his feed in developing the regions of the higher-priced cuts - loin ribs and hindquarters.

SMITH: Does it always pay to buy the best steers.

THE DOCTOR: No, it doesn't. There are not enough of them produced and just as much may often be made in feeding the lower grades. Still there's a lot of satisfaction in handling a first-class product.

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U. S. RADIO FARM SCHOOL   Mon. Oct. 24/27.

(NOT FOR PUBLICATION)

Crops and Soils Meeting No. 4.

SUBJECT: Farm Storage of Vegetables.

ANNOUNCEMENT: Here we are at the school-house again. Most of the other farmers seem to be already here. This is the day for the crop meeting. There's the Department of Agriculture expert's automobile over there-- Come on, let's go on in. I believe they've already started. Just lift up on the latch there --------

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THE DOCTOR: You can find seats down front here!--I was just telling these men, all garden truck intended for storage should be handled carefully. It should be dug or gathered when reasonably dry. In most cases it's an easy matter to arrange storage --------

BREWSTER: Can you keep Irish potatoes in pits in the ground?

THE DOCTOR: Yes, provided you keep the frost away from them. I have a cool, moist cellar. It's just right for storing potatoes. You know, potatoes need to be kept cool. From 36 to 39 degrees Fahrenheit is about right for them. They shouldn't be kept too dry, either.

Now then, on the other hand, sweet potatoes must be kept reasonably warm and perfectly dry. They need to be cured for several days at a temperature of 80 to 85 degrees with plenty of ventilation as soon as they are dug. Then they should be kept at a temperature of about 60 degrees.

BREWSTER: Would a room over the kitchen be about right?

THE DOCTOR: I expect so. Bill Smith over there stores his to advantage on a shelf near the furnace in the basement. But he has a good, dry basement. I store my sweet potatoes in a corner of the kitchen a little ways from the stove. Under the most favorable conditions in the South, sweet potatoes may be kept in banks or pits, provided the ground where the pit is located is well drained and the sweet potatoes are kept perfectly dry. And speaking of pits; beets, carrots, turnips, rutabagas, salsify, and parsnips can all be stored in outdoor banks or pits.

BREWSTER: In cold climates they're pretty hard to get out during winter, I understand.

THE DOCTOR: Well, I'll tell you, Brewster, you can make a good substitute for the pit and one that will be easier to get at in cold weather. Take a big barrel or

store box and bury it in the ground. Arrange it so one end can be opened. And, of course, you understand, all the root crops should be lifted before they are injured by freezing. Beets, carrots, turnips and rutabagas must be lifted after the first mild frost. They must be stored before hard freezing weather begins. In lifting them, cut off the tops with a sharp knife a half inch to an inch above the root.

BREWSTER: Would you store parsnips and salsify that same way?

THE DOCTOR: Yes. As you know, parsnips and salsify are often left in the ground where grown and harvested when they're needed. But it is hard to secure the roots when the ground is frozen. They say, however, that mild freezing in the soil improves the flavor of both of them. All the root crops may be kept in better condition in the cellar, if they're packed in clean, moist sand.

BREWSTER: I've found cabbage pretty hard to keep in the cellar. Where's the best place to keep it?

THE DOCTOR: Most cellars are too warm and too moist for cabbage. It is better to bury it in a pit in the open ground. The usual way is to pull the heads and bury them with the stems and leaves on them. First dig a long narrow trench not more than 5 or 6 inches deep. Lay the cabbage heads on their sides in the bottom of this trench with all the stems in one direction. Then place another layer, or even two layers, on top of the first layer, narrowing the pile of cabbage as you go upward. Then cover the cabbage first with a little clean straw or with building paper. On top of that add a light covering of earth. As the weather becomes colder, add more earth. Leave one or two openings in the pit for ventilation, especially when the cabbage is first buried.

BREWSTER: Sidney Holton was telling me another way to store cabbages the other day. He cuts the heads with most of the leaves attached and puts them in a box or barrel buried in the ground.

THE DOCTOR: That's all right, too. Except you should be sure the box or barrel is well drained --- and be careful to provide protection against freezing. Cabbages can also be kept to advantage with the heads laid on shelves in outdoor cellars. In mild climates, cabbage is often stacked in small piles and covered with a thick mat of pine boughs.

BREWSTER: How about celery. Is it all right to just bank it to the top with earth right where it is grown?

THE DOCTOR: Yes, bank it to the top with earth. Then put a little straw, leaves or boards or both straw and boards over the top of the bank. Another way to store celery, is to lift the celery and place it in a trench. The trench should be dug about 12 inches wide and 14 inches deep. Pack the celery with its roots attached closely together in the trench. After you fill in the trench, cover it first with boards; then with straw, leaves, corn fodder, or anything that will keep out the cold. Very little covering is needed at first. As the weather gets colder, you should put on more, but be careful to avoid covering too closely. Close covering will cause celery to decay. Some farmers make a practice of storing celery in the pit of a hotbed covering the bed with boards and with some material to keep out cold.

Onions need a somewhat different storage from most farm vegetables. The garage is a good place to store them, because the garage is usually dry, well ventilated, and is not allowed to freeze. A temperature of two or three degrees below freezing for a short time will not hurt onions, especially if the onions are not disturbed. The garage is also a fine place to store dry beans, peas, popcorn, and anything of that character. Squashes and pumpkins should be gathered before freezing weather, preferably before hard frosts. They need about the same storage conditions as sweet potatoes; that is, reasonably warm and dry. A shelf near the furnace in a dry cellar is all right or some room which is moderately heated.

Another thing you might store to advantage is tomatoes. There is no reason why the family should not enjoy tomatoes at least a month after frost. There is often a lot of nice green tomatoes and peppers in the garden when the first hard frost comes. They should be gathered before frost.

BREWSTER: Green tomatoes and green peppers need to be kept very cool, don't they?

THE DOCTOR: No, that's a mistake a good many people make. They need a fair amount of warmth to ripen them. They should be stored on shelves or in shallow crates in a warm, cellar or better still right in the living room where the temperature is anywhere between 65 and 70 degrees. A little water should be sprinkled over the green tomatoes from time to time to prevent their shriveling.

And before we leave this subject of storing vegetables, I want all of you to remember, all garden products intended for storage should be dug or gathered when reasonably dry. And above all, all garden products intended for storage should be handled carefully.

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U. S. RADIO FARM SCHOOL

Wednesday Oct. 26.

Farm Economics Meeting No. 2.

(NOT FOR PUBLICATION)

SUBJECT: Crop Yields Per Acre.

ANNOUNCEMENT: You remember last week at this time, the farmers of our community club, which meets three times a week at the old school house, were talking about the size of their farm businesses. The Department of Agriculture expert gave them some important figures on that subject. Now here we've all met again, but some of these farmers are still talking size of farms. There's Henderson over there. He's arguing to beat the band. Can you hear him?

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HENDERSON: -- I tell you, size isn't the whole of it, by a long shot. I know farms doing a big-sized business, but they're not clearing anything. I know others that don't do near as much business, but they're bringing in good incomes ----

THE DOCTOR: That's right. Henderson. And often there are variations in the incomes from farms of the same size. Size is not the whole story.

HENDERSON: I'm glad to hear you say that, Doc. That's just what I've been telling these men. I claim that crop yields per acre is what counts.

THE DOCTOR: Crop yields per acre are important. There's no question about that. The size of the farm business is very important. But, of course, you cannot depend on that alone. Now, speaking of crop yields per acre, our studies in several localities in the United States throw a good bit of light on that. In each locality, we found that the farmers with the best crop yields per acre averaged almost four times as much income for their work as these farms in the same locality which had the poorest yields.-----

HENDERSON: Four times as much income! That's a pretty good showing for the importance of crop yields, I'd say.

THE DOCTOR: Oh, if you just take the localities where the sales of crops make up the bigger part of the income, the comparison is even more striking. In such localities, the Department of Agriculture investigations showed that the average income from the farms with the best crop yields per acre were more than six times as much as from the farms with the poorest yields.

An 80-acre farmer in central Indiana who averaged 50 bushels of corn, 45 bushels of oats, and 20 bushels of wheat per acre, made an eight-

year average labor income of $556. Another 80-acre farmer in the same locality who averaged 40 bushels of corn, 40 bushels of oats, and 15 bushels of wheat per acre, made an average labor income of $121 during the same period. In other words, the better yielding farm made an eight-year average of 10 bushels more of corn, 5 bushels more of oats, and 5 bushels more of wheat per acre.

In Sumter County, Georgia, in 1913, when cotton sold at around 12 cents per pound, there was a farm of 100 acres of tilled land with a rather low yield of cotton. That farm returned a labor income of $310, while another farm of about the same size, but with a good yield, returned $1123.

In 1918 when cotton sold for almost 30 cents, a low yielding farm returned a labor income of $337, while a good yielding farm returned $2,563. But in 1924 when cotton sold at around 20 cents a pound, and the cost of production was much higher than in 1913 or 1918, a low yielding farm lacked $384 of returning any labor income at all, while a good yielding farm returned $600.

In 1918 when the prices of cotton were much higher than in 1913, the low yielding farms made but little more than in 1913, while the high yielding farms made more than twice as much as in 1913, and in 1924 when costs were high, the low yielding farms could not make a profit while the high yielding farms did fairly well.

HENDERSON: Then, Doc, I'm safe in saying that the farms with the best crop yields average higher incomes than those with the poorer yields.

THE DOCTOR: Yes, Henderson, that holds true in all localities. But understand me, it does not follow that all farms with higher yields return good incomes, nor that all farms with low yields return poor incomes. From the studies of a large number of farms by the United States Department of Agriculture 22 per cent of the farms with high crop yields per acre returned poor labor incomes. Eleven per cent of those with low crop yields had good incomes. Some farmers make fairly good profits with low yields because some other phases of the business are developed enough to offset the low yields. There is no question, however, that those same farmers could make more money with higher yields.

A dairy farmer in Wisconsin whose crop yields per acre were 16 per cent lower than the average made a labor income of $529 per year over a period of five years, while his neighbors with low yields averaged $266. This farmer had good cows. He fed and cared for them so well that their annual production averaged 15 per cent above that of the locality and more than offset the low crop yields.------

HENDERSON: Sure. I've known farmers to get high yields and not make good profits. They lost on other branches of their farming business.

THE DOCTOR: Yes. We had an instance of that in the seven-year record of the business on a farm in the hills of southeastern Ohio. The yield of crops

on that farm was 15 per cent above the average of that locality for the seven-year period. The yield of corn was 53 bushels per acre, while the average in the neghborhood was 41 bushels. One year that farm made 75 bushels to the acre, while neighboring farms made 52 bushels. But it had only three acres of corn that year, while neighboring farms averaged 10 acres. For the seven years, there was an average of 8 acres of corn on that farm, and 11 acres on neighboring farms. The livestock production per animal was about average, but there were only 2 cows, 1 sheep, 100 chickens, and 2 work horses. Neighboring farms averaged 4 cows, 15 sheep, 1 brood sow, 135 chickens, and 3 work horses. There were only 21 acres of crops on that farm, while there was an average of 44 acres on neighboring farms. That resulted in only 17 acres of crops per man and 11 per horse, while neighboring farms averaged 30 acres of crops per man and 17 per horse. Although that farm had high crop yields and fair livestock production per animal, it was a small business when measured by the acreage of crops and the amount of livestock, and had a low labor efficiency when measured by crop acres per man and per horse. The seven year average labor income on that farm was $137, while that of the neighboring farms with good crop yields per acre was $583.

HENDERSON: Yes, and there's another thing, Doc. Some get high yields, but they spend too much getting them, for it to pay.

THE DOCTOR: That's true, too. Take an instance from the wheat-growing Palouse country of Idaho and Washington. There one of two average sized farms returned a labor income of $4,062 and the other $688. The greater part of the difference in income was due to difference in cost -- too high costs per acre and per bushel of wheat on the second farm. It cost one $1.50 a bushel, while the low income farm had a cost of $1.87 or 37 cents more on the bushel. The main part of the difference was in the costs of man labor, horse work and machinery. As I say, labor income as a rule goes up with crop yields. But there are other things. Next time I'll bring in some figures on livestock production and show what part it plays.

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UNITED STATES DEPARTMENT OF AGRICULTURE
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U. S. RADIO FARM SCHOOL. Fri. Oct. 28, 1927

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(NOT FOR PUBLICATION)

Livestock and Dairy Meeting No. 4.

SUBJECT: Herd Improvement Through Testing.

ANNOUNCEMENT: The United States Radio Farm Club is again in session in the old school house here. We hold these community meetings three times a week. Mondays we talk crops. Wednesday we talk farming from a business standpoint. Fridays we get together with the specialist from the Department of Agriculture there and discuss either livestock or dairy questions. If you could see the milk-men here you'd know that this was dairy day. ----------

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(Sound as if rapping for order)

GRAHAM; Pipe down there! ------

NELSON: Professor!

THE PROFESSOR: All right, Nelson. What's on your mind?

NELSON: George Brunton has been after me to join this dairy-herd-improvement association. I wanted your advice on it. What's the difference between it and the old cow testing association?

THE PROFESSOR: Just a difference in name. Its work has not changed. Its chief purpose is just the same; to bring about more economical milk and butterfat production. The method is the same; getting individual cow records for close culling, proper feeding and intelligent breeding.

The dairy-herd-improvement records show the owner how much feed each cow in the herd is eating. They show how much milk and butterfat each cow is producing. And they show how much income over cost of feed each cow is bringing in.

NELSON: With all that information it should be easy to tell which cows are the paying ones.

THE PROFESSOR: That's the big idea. With such records, the owner of any dairy herd can put it on a profitable basis by eliminating all the unprofitable cows. By culling a little more closely, and so keeping only the high-producing cows, he can put his herd on a highly profitable basis.

The first step in dairy herd improvement is the elimination of low producers. The second step is the feeding of the remainder of the herd according to known production, and the third step is the use of good purebred dairy sires,

preferably proved sires.

NELSON: Don't those high-producing cows take more feed.

THE PROFESSOR: Yes. Dairy-herd-improvement-association records show that it costs more to feed a high-producing cow than her low-producing sister ------

NELSON: That's what I allowed.

THE PROFESSOR: Yes, the high-producer does take more feed, but the added returns are proportionately higher than the added cost of feed. In other words, the high-producer pays better. Association records show that as production doubled, that is increased from 4,500 pounds of milk a year to 9,000 pounds, the cost of feed went up only 40 per cent. In other words, 40 per cent more feed given to better cows brought 100 per cent more milk. Evidently, it pays to feed good dairy cows well. It doesn't pay to feed poor cows at all.

The records show that high production per cow nearly always results in a big gross income per cow. And a big gross income nearly always results in a big net income; at least in a big average income over cost of feed. Every dairyman should set some production and income standard for his dairy herd.

NELSON: Income standard? What is a good standard, Professor?

THE PROFESSOR: A very good standard would require that the gross returns from the sale of dairy products should be more than $2.50 for every dollar spent for feed. The herd should return each year more than $100 per cow in income over cost of feed.

NELSON: That's pretty high, isn't it?

THE PROFESSOR: Well, many dairy herds now on test in dairy-herd-improvement associations have already passed the mark.

NELSON: But testing cows isn't going to make them give more milk, is it,

THE PROFESSOR: No, but the dairyman who belongs to a dairy-herd-improvement association knows what progress he is making. He knows what his herd is producing this year as compared with last year. If the herd is not making satisfactory progress he knows the reason. And knowing the reason, he can usually find the remedy.

NELSON: Can't a man do his own testing --without belonging to any association?

THE PROFESSOR; Well, he may start it, but the chances are he won't keep it up. It is also very doubtful whether he can do the work more cheaply than the association's hired tester will do it for him. Yes, sir, every dairyman who wants to make fast progress in his work should belong to a dairy-herd-improvement association, if it is practical for him to do so. Many dairymen are working for

low wages. If they build up a herd of high producers they will then work for comparatively high wages. In the dairy business, no one needs to work for low wages. You know, milk production per cow in this country is increasing. During the last 6 years for which we have the figures, the average yearly gain was about 150 pounds.

NELSON: Did the dairy-herd-improvement association cause that increase?

THE PROFESSOR; Of course, no one knows just what part testing played, but it's certain that testing had a good deal to do with it. Dairy-herd-improvement association records show even bigger gains. There are now nearly 400,000 cows on test in dairy-herd-improvement associations. Records tabulated before 1920 showed an average yearly milk production of 6,077 pounds a cow. In 1924, the production had increased to 7,060 pounds a cow. About September first of this year, the records showed the average production to be 7,425 pounds a year.

NELSON: What part of the country did those records come from, Professor?

THE PROFESSOR: From practically all parts of the country. These figures prove conclusively that it is possible to bring about great improvement in our dairy herds through testing for economical production. As the population of this country increases there will be a need each year for more dairy products. By gradually bringing more and more of our herds up to the level of those now on test, it will be possible for a long time to come to supply our people with an abundance of milk and milk products; and do it with the same number of cows we now have.

NELSON: The higher production gets, the harder it will be to increase production of each cow. There must be a limit some where.

THE PROFESSOR: Yes. It takes good head work to breed up a herd of dairy cows having an average yearly butterfat production of 400 pounds or more. But bear this in mind, all of you, it is well within the range of possibility to raise the average yearly milk production of our dairy cows to 9,000 pounds a year. In other words, to twice the amount of milk being produced by the average cow today. But we will have to know what we are doing to do it. We will have to keep the cows on test.

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U. S. RADIO FARM SCHOOL

Mon. Oct. 31, 1927.

(NOT FOR PUBLICATION)

Crops and Soils Meeting No. 5.

SUBJECT: Farm Woodlands and Their Value

ANNOUNCEMENT: Our farmers club is getting along nicely. You know we meet three times a week; Mondays, Wednesdays and Fridays. One of the experts from the Department of Agriculture is always on hand and he tells us what the Department has found out. We meet here in the school-house and sometimes have some lively discussions. There's Mr. Jordan, the Department man, now. That man who is doing the talking is Jim Stevens.

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STEVENS: ----Oh, I never think of woods being part of a farm business---leastwise, not an important part.

JORDAN: I've known many like you, Stevens. They often have forty or fifty acres of woods. They never seem to think of handling the woods as a crop. Too often the woods itself is just a chance, imperfect reforestation of land that was cleared and cultivated for a few years before being abandoned.

STEVENS: You're just about right about that, Mr. Jordan.

JORDAN: Yes, but in spite of that, the average farmer gets a crop of fuelwood, logs, cross-ties, poles, etc. worth about $400 a year.

STEVENS: I never realized it would amount to that much----

JORDAN: Sure it does. Don't you realize that the farmers of America own over 143 million acres of woodland.

STEVENS: One hundred and forty-three million acres!

JORDAN: Yes, the farmers own nearly one third of all the timberland in the country.

STEVENS: Where are the farmers who own all that timber?

JORDAN: Well, most of these woods are east of the Mississippi River. They are close to the great consuming markets. If all the farm woods could be fitted close together like the pieces of a jig-saw picture puzzle, they'd make one farm woods as big as all the land in the States from Virginia north to Maine. There are nearly $400,000,000 worth of forest products cut from these woodlands in a year's time. In many cases, they represent the most complete use of wood crops that we have anywhere in America.

STEVENS: What's the wood used for?

JORDAN: The better trees go into lumber of piling. The small ones are used for cross-ties, posts, and poles. Maybe some pulpwood is cut for the paper mills. What is left goes for firewood. And, of course you know, in the North the maple groves yield sirup and sugar. Southern pines furnish turpentine and rosin. Here and there over the country, the leaf litter and pine straw from the farm woods are used to fertilize or mulch the agricultural crops.

STEVENS: Yes, and there's another thing you might mention. I know from experience that woods are worthwhile because of wind protection. That's where I used to win with mine. The saving shows in the fuel and feed bills.

JORDAN: Undoubtedly. A woodland along the windward side of the homestead or the feed lot is a natural barrier against the winter wind storms. Stock thrive under its protection and the home keeps warm in spite of drops in temperature. And that's not all, either. The woods that protect the home and the stock in the feed yard also protect the streams and springs. Woods may not increase the amount of rain or snow that may fall on a given area, but they hold back the runoff, feed the springs, help keep the streams and springs from filling up with silt and so save the water so it will be there when you want to use it. The life of many springs depend on the nearby farm woods.

Then, too a woods whose sides are filled with brush builds its own windbreak. Wild flowers bloom from spring until fall. Tree seedlings and grass thrive in the openings. No wonder it invites the birds and harbors squirrels, rabbits and perhaps larger game. Clear springs of cold water feed shady streams where trout or bass lurk. You don't have to be a sportsman to enjoy this wild life. Few can resist the "call of the wild" when the fish are jumping or the hunting season is on. With picnics and holiday hikes, added to the privilege of hunting and fishing, the woods may be a year round playground-----

STEVENS: You certainly believe in farm woods, Mr. Jordan. You're downright poetic on the subject.

JORDAN: Well, just put that pleasure ground feature of the farm woods on a money basis, if you will. If you had to pay for these things at a price comparable to what you pay for other entertainment and recreation, many a farm woods pays for itself in pleasure alone. It gives its other benefits as by-products.

STEVENS: There's one of those by-products you overlooked.

JORDAN: Which one was that?

STEVENS: You never mentioned using farm woods as pasture. I guess the forage in the woods is worth getting.

JORDAN: Well, if the woods were in the best possible condition, there wouldn't be enough grass under the trees to satisfy the livestock. Of course, carefully supervised grazing in the woods will prevent the stock from tramping and destroying forest growth, but ordinarily you can count the forage of the farm woods' of doubtful value. No sir, using the wood lot for pasture is an expensive way to

raise livestock. A year's woodland forage production is estimated to be worth 25 cents to $1.25 an acre. In the same time a well-managed wood lot will add from one-half to 1 cord of wood.

A wood lot, like a herd of cattle, will develop in quantity, quality and value if you give it common-sense treatment. Too often, wood-lots don't get that kind of treatment. If you kept killing off and selling your best cattle, pretty soon you'd have only scrubs. It's the same way with the farm wood lot. If you cut out the best trees and leave the poorer ones, you're bound to produce scrub woods.

My advice to you, Stevens, is never to sell to prospective buyers all the choice trees in the woods unless you can cut the poorer species at the same time. And in cutting cordwood for home use or sale, you should take out the scrubby, limby, less valuable trees. In that way your cutting will pay double; by giving the valuable timber more space to grow.

Keep fires out of the farm woods. They kill back the young trees in the brush stage or even those up to 4 to 6 inches in diameter. They burn into the bigger trees at the butt and greatly reduce the value of the butt log, either because of the fire scar or because rot or insects get in through the wound the fire scar makes. Then, too, fires burn up the leaves and litter and make the soil less fertile by robbing it of its natural fertilizer.

Farm your wood lot as a crop. It will give you valuable returns in wood and timber; and one beauty about it is that you don't often have to sell your wood crop in a hurry. You can often wait until prices are favorable. Wood lots are important now and they are going to be even more important in the future.

And don't forget those intangible returns; the protection the woods give the homestead, the livestock, and the water supply, and the sporting value of the wild life and the recreational or inspirational returns.

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